Beamline for Materials Measurements (BMM)

BMM at NSLS-II

- Will enable materials studies of both local and long-range atomic structure
- High throughput, high quality x-ray absorption fine structure (XAFS) measurements for materials studies
- High throughput, high quality x-ray diffraction (XRD) measurements for materials studies
- Advanced spectroscopy techniques combining both XAFS and XRD

Examples of Science Areas & Impact

- MICROELECTRONICS: Strain engineering studies of electronic thin films and materials
- CATALYSIS AND CHEMICAL SCIENCES: High throughput XAFS studies of chemical reactions and catalysts
- PHASE TRANSITIONS AND ENVIRONMENTAL SCIENCE: Quantitative XRD and XAFS from same samples under identical environmental conditions

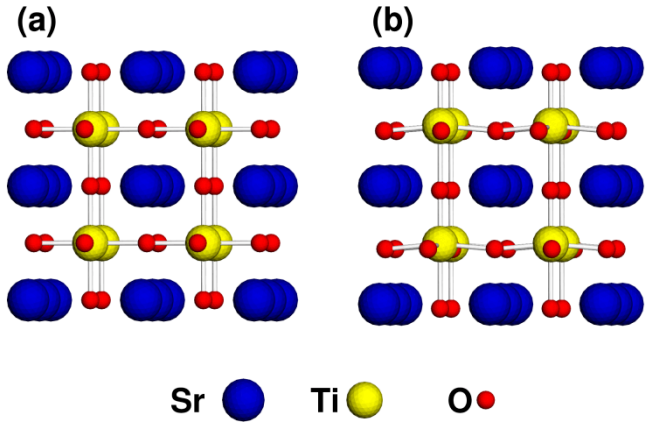

*Figure 3: (a) Structure of cubic $SrTiO_3$. (b) Structure of strained $SrTiO_3$ on Si(001) as calculated by density functional theory. The structure in (b) reveals both AFD and FE distortions and has been confirmed by both XAFS and XRD. Woicik et al., Phys. Rev. B **75**, Rapid Communications, 140103 (2007). Warusawithana et al., Science **324**, 367 (2009).*

Beamline Capabilities

TECHNIQUE(S): x-ray absorption fine structure (XAFS) and x-ray diffraction (XRD)

SOURCE: three-pole wiggler

ENERGY RANGE / RESOLUTION: 4.9 keV – 30 keV / 1 eV – 5 eV

SPATIAL RESOLUTION: 100 μm x 100 μm

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